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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/648,455	08/28/2000	Tomio Iwasaki	500.38949X00	5434

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ANTONELLI TERRY STOUT AND KRAUS
SUITE 1800
1300 NORTH SEVENTEENTH STREET
ARLINGTON, VA 22209

EXAMINER

OWENS, DOUGLAS W

ART UNIT	PAPER NUMBER
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2811

DATE MAILED: 01/11/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/648,455

Applicant(s)

IWASAKI ET AL.

Examiner

Douglas W Owens

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-4 is/are allowed.
- 6) ☒ Claim(s) 5-9 and 11 is/are rejected.
- 7) ☒ Claim(s) 10 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

DETAILED ACTION

Specification

1. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

2. The abstract of the disclosure is objected to because the first three lines of the abstract refers to purported merits of the claimed invention. Correction is required. See MPEP § 608.01(b).

3. The disclosure is objected to because of the following informalities:

in lines 18 and 19 of page 1, the phrase "...it is proposed, in JP-A-8-186175 and etc..." is confusing because it is not known what is encompassed by "and etc."; and

in line 18 of page 2, "researches" should be replaced with "research";.

Appropriate correction is required.

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4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 5 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by US patent No. 6,306,762 to Nakamura et al.

Regarding claim 5, Nakamura et al. teaches a semiconductor device, comprising aluminum conductors (13) containing copper and silicon (Col 3, lines 22-24) on a substrate.

Regarding claim 8, Nakamura et al. teaches a semiconductor device, comprising aluminum conductors containing copper and silicon on a substrate, with a film comprising titanium (14) adjacent the aluminum conductor.

Claim Rejections - 35 USC § 103

6. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al.

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Regarding claim 6, Nakamura et al. does not teach a semiconductor device, wherein the conductor spacing is not more than 0.4 microns. It is conventional in the art to form features on a wafer that are closer than 0.4 microns, and at least as close as 0.18 microns. It would have been obvious to one of ordinary skill in the art to scale the space between features on a semiconductor device, since it is desirable to save lateral space on the wafer in order to reduce cost and increase yield.

Regarding claim 7, Nakamura et al. teaches a concentration of 1 at. % silicon in the aluminum layer. Nakamura et al. does not teach a concentration of 0.05 to 0.4 at. %. The concentration of dopants in certain conductive layers is a known variable that is subject to optimization. It would have been obvious to one of ordinary skill in the art to find the optimal concentration of silicon through routine experimentation.

7. Claims 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over US patent No. 4,710,398 to Homma et al. in view of Nakamura et al.

Regarding claim 9, Homma et al. teaches a semiconductor device comprising an aluminum alloy (Col. 2, lines 57-59) adjacent a platinum film (26) (See Col. 2, lines 49-51 and Col. 4, lines 57-63 (A noble metal may be used for the intermediate layer 26)). Homma et al. does not teach an aluminum alloy that contains copper. Nakamura et al. teaches that it is common in the art to add copper to aluminum alloy layers. It would have been obvious to one of ordinary skill in the art to incorporate the copper containing aluminum alloy taught by Nakamura et al. into the device taught by Homma et al. since the benefits of adding the copper are desirable.

Regarding claim 11, neither Homma et al nor Nakamura et al. teach a concentration of 0.05 to 0.4 at. %. The concentration of dopants in certain conductive layers is a known variable that is subject to optimization. It would have been obvious to one of ordinary skill in the art to find the optimal concentration of silicon through routine experimentation.

Allowable Subject Matter

8. Claims 1-4 are allowed.
9. The following is a statement of reasons for the indication of allowable subject matter: The prior art does not disclose an aluminum alloy containing copper and nickel.
10. Claim 10 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Douglas W Owens whose telephone number is 703-308-6167. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

DWO
January 8, 2002

Steven Loke
Primary Examiner

A handwritten signature in cursive script that reads "Steven Loke".